

## REMARKS

Entry of the foregoing and reconsideration of the subject application are respectfully requested in light of the amendments above and the comments which follow.

As correctly noted in the Office Action Summary, claims 1, 3-11, 13, 21 and 27-32 were pending. By the present response, claims 1 and 11 have been amended. Thus, upon entry of the present response, claims 1, 3-11, 13, 21 and 27-32 remain pending and await further consideration on the merits.

Support for the foregoing amendments can be found, for example, in at least the following locations in the original disclosure: the original claims and

Entry of the forgoing is appropriate pursuant to 37 C.F.R. §1.116 for at least the following reasons. First, the amendments address the new grounds of rejection under 35 U.S.C. §112, second paragraph, thereby reducing the number of issues present upon appeal. Second, the amendments raise no new issues that would necessitate further search and/or substantive reexamination. Third, the amendments clearly overcome the grounds of rejection.

## ***CLAIM REJECTIONS UNDER 35 U.S.C. §112***

Claims 1, 3-11, 13, 21 and 27-32 stands rejected under 35 U.S.C. §112, second paragraph, on the grounds set forth in paragraph 2 of the Official Action.

By the present response, applicant has amended claim 1 in a manner which addresses the above-noted rejection. Namely, applicant has amended claim 1 to clarify the use of both open language (comprising) and closed language (consisting of) in the claim. Here, claim 1 comprises a combination of three operational units

and the combination consists of a NO<sub>x</sub> adsorption catalyst, an oxidation catalyst effective to promote oxidation of NO to NO<sub>2</sub> during said lean mixing ratio, and a particle separator.

In other words, claim 1 indicates that the claimed system can include several components (such as the combination of operational units of claim 1 and additional components in the dependent claims), but that the combination of operational units consists only of a NO<sub>x</sub> adsorption catalyst, an oxidation catalyst effective to promote oxidation of NO to NO<sub>2</sub> during said lean mixing ratio, and a particle separator. As clarified, this is not an ambiguity in the claim language, but rather a proper use of open and closed language to indicate what elements can be included in the system (the open portion of the claim) and what elements are limited to the combination (the closed portion of the claim).

With regard to claim 5 (and similarly cited claims 6, 7, 10 and 31-32), these dependent claims recite additional features of the system of claim 1. The system of claim 1 uses open language. Therefore, these claims are properly dependent in that they add additional features to the independent claim.

With regard to claims 8, 27 and 288, these claims indicate that there are still three distinct operational units, but the arrangement and location of the units within the combination are more distinctly specified. For example, claim 8 indicates that the arrangement of a) the adsorption catalyst and/or oxidation catalyst and b) the particle separator within the combination of operational units is limited to an arrangement within the system such that they are "in the same structure." Similarly cited claims 27-28 express similar features, in that the claim specifies locations of units within the combination that is part of the claimed system.

With regard to claim 11, this claim now recites a positive limitation on the type of engine, i.e., that it periodically adjust the mixing ratio. While using functional language, the claim itself also is structural in that this limitation is a feature of the type of engine in which the system appears.

Based on the above, reconsideration and withdrawal of the rejections are respectfully requested.

#### ***CLAIM REJECTIONS UNDER 35 U.S.C. §103***

Claims 1, 3-5, 8-9 and 27-30 stands rejected under 35 U.S.C. §103(a) as being unpatentable over WO 00/21647 (hereafter "WO '647") on the grounds set forth in paragraph 5 of the Official Action. For at least the reasons noted below, this rejection should be withdrawn.

Claim 1, the only independent claim at issue here, recites that a system for purifying a flow of exhaust gases of diesel or gasoline multicylinder engines comprises a combination of operational units. The specifically claimed combination consists of three operational units including a NO<sub>x</sub> adsorption catalyst, an oxidation catalyst effective to promote oxidation of at least NO to NO<sub>2</sub>; and a particle separator. In a flow direction of the exhaust gas, the NO<sub>x</sub> adsorption catalyst is arranged before said oxidation catalyst or the NO<sub>x</sub> adsorption catalyst is arranged in the same structure with the oxidation catalyst of the three operational units. The system reduces the amounts of hydrocarbons, carbon monoxide, nitrogen oxides and particles present in the exhaust gas.

WO '647 discloses a four unit combination of operational units including, in sequence, a 1<sup>st</sup> catalyst to oxidize NO to NO<sub>2</sub> (NO oxidation catalyst), a filter (PF) as

a 2<sup>nd</sup> unit, a NO<sub>x</sub> adsorber (NO<sub>x</sub> trap) as a 3<sup>rd</sup> unit and a three-way catalyst (TWC) as a 4<sup>th</sup> unit.

Thus, comparing claim 1 to WO '647 it can be seen that claim 1 recites a specific closed group of three operational units in the combination – namely, a NO<sub>x</sub> adsorption catalyst, an oxidation catalyst effective to promote oxidation of at least NO to NO<sub>2</sub>; and a particle separator. In contrast to claim 1, WO '647 includes four operational units. Figure 1 illustrates these four units as oxidation catalyst 14, filter 16, NO<sub>x</sub> absorber 28 and 3-way catalyst 30. Thus and in view of the closed language associated with the combination of operational units, WO '647 does not meet the claim feature of a combination of operational units consisting of the three named units. Further, there is no suggestion, teaching or motivation to modify the disclosure in WO '647 to remove one of the disclosed operational units. Thus, the rejection has not established obviousness because the reference does not disclose, teach or suggest all of the claimed features. See, MPEP §2142-43. For at least this reason, withdrawal of the rejection is respectfully requested.

Furthermore, comparing claim 1 to WO 647 it can be seen that claim 1 recites a specific arrangement in the flow direction of the three operational units – namely, the NO<sub>x</sub> adsorption catalyst is arranged before said oxidation catalyst or the NO<sub>x</sub> adsorption catalyst is arranged in the same structure with the oxidation catalyst. However, in contrast to claim 1, WO '647 arranges the operational units in a different sequence from claim 1. As seen in Figure 1, the units of WO '647 arranged in the flow direction are oxidation catalyst 14, filter 16, NO<sub>x</sub> absorber 28 and 3-way catalyst 30. For at least this further reason, withdrawal of the rejection is respectfully requested.

The remaining rejected claims depend either directly or indirectly from independent claim 1 and distinguish over the disclosure in WO '647, for at least the same reasons as outlined above. Withdrawal of the rejection of these dependent claims is respectfully requested.

Claims 6-7, 10, 13, 21, 31 and 32 stand rejected under 35 U.S.C. §103(a) as being unpatentable over WO '647 in view of U.S. Patent No. 4,887,427 to Shinzawa et al. (hereafter "*Shinzawa et al.*") or DE 3,518,756 (hereafter "*DE '756*") on the grounds set forth in paragraph 6 of the Official Action. Also, Claim 11 stands rejected under 35 U.S.C. §103(a) as being unpatentable over WO '647 in view of *Shinzawa et al.* or *DE '756* as applied to claim 10 above and further in view of EP 758,713 (hereafter "*EP '713*") on the grounds set forth in paragraph 7 of the Official Action. For at least the reasons noted below, this rejection should be withdrawn.

The rejected claims depend either directly or indirectly from independent claim 1. However, the secondary references cited here do not contribute to overcome the deficiencies associated with the primary reference, WO '647.

For example, *Shinzawa et al.* discloses a catalyst equipped filter 50a-50d arranged in each of four branches of a manifold 12 and additional catalyst equipped filters 14 and 15 arranged in series in an exhaust gas passage downstream of the manifold 12 (see Fig. 4 and col. 12, lines 11-38). *Shinzawa et al.* does not disclose the claimed combination of three operational units nor does it disclose the claimed order of such units. Therefore, *Shinzawa et al.* does not contribute to overcome the above noted deficiency in WO '647, nor in combination with the other references does it contribute to establish *prima facie* obviousness.

Also, *DE* '756 discloses an exhaust pipe with a catalyser. However, such disclosure does not contribute to overcome the above-noted deficiencies in the other references with respect to the present claim 1.

In addition, *EP* '713 discloses, in order in the flow direction, an oxidizing catalyst 5, a filter 7 and a NOx absorbent 9 (See, for example, Fig. 1). *EP* '713 does not disclose the claimed order of such units. In combination with the other noted references, it is respectfully asserted that no motivation has been shown to make the proposed modifications. Indeed, there is no showing as to why one of ordinary skill would be motivated to remove an operational unit from *WO* '647 and why one of ordinary skill would be motivated to rearrange the order of the units. Since the order of the units is an outcome determinative variable (in that it effects the operation of the system), it is not merely a matter of design choice, which is more appropriately a motivation where the variable is not outcome determinative, as asserted by the Examiner. Therefore, *EP* '713 does not contribute to overcome the above noted deficiency in *WO* '647, nor, in combination with the other references does it contribute to establish *prima facie* obviousness.

Based on the above, withdrawal of the rejection is respectfully requested.

Claim 1, 3-5, 8-9, 11 and 27-30 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *EP* '713 on the grounds set forth in paragraph 8 of the Official Action. For at least the reasons noted below, this rejection should be withdrawn.

The disclosure and deficiencies in *EP* '713 have been previously noted (see above). Since the order of the units is an outcome determinative variable (in that it

effects the operation of the system), it is not merely a matter of design choice, which is more appropriately a motivation where the variable is not outcome determinative, as asserted by the Examiner. Rather, the Examiner appears to rely upon impermissible hindsight in proposing the rejection. The stated ground of rejection in paragraph 8 of the Official Action is deficient in that it fails to state the requisite degree of motivation as to why one of ordinary skill in the art would have been motivated to modify the teachings of *EP '713* in the manner proposed. Moreover, it is clear that the stated motivation for modifying the teachings of *EP '713* has not been derived from the prior art, but rather from the applicants' own disclosure. Thus, the rejection is based upon impermissible hindsight.

For at least the above-noted reasons, the rejection is improper and should be withdrawn.

Claim 6-7, 10, 13, 21 and 31-32 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *EP '713* as applied to claims 1, 3-5, 8-9, 11 and 27-30 above and further in view of *Shinzawa et al.* or *DE '756* on the grounds set forth in paragraph 9 of the Official Action. The rejected claims depend either directly or indirectly from independent claim 1. However, the secondary references cited here do not contribute to overcome the deficiencies associated with the primary reference, *EP '713*. Therefore, withdrawal of the rejection is respectfully requested.

**CONCLUSION**

From the foregoing, further and favorable action in the form of a Notice of Allowance is earnestly solicited. Should the Examiner feel that any issues remain, it is requested that the undersigned be contacted so that any such issues may be adequately addressed and prosecution of the instant application expedited.

Respectfully submitted,

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